USB-CTR-15 USB Digital Counter/Timer Module

FEATURES

- High-speed USB 2.0 device, USB 1.1 compatible
- Fifteen independent 16-bit counter/timers (5 x 82C54-10)
- Clock, gate and out signals from all 15 channels buffered and accessed via 1 connector
- PC/104 module size (3.550" by 3.775") and mounting compatibility
- Standard configuration adaptor pre-configured for event counting, frequency measurement, pulse width measurement, or frequency generation
- Removable screw-terminal board for easy wiring
- User wiring adaptor card provided for flexible yet easy counter concatenation/configuration
- Rugged small-sized (4" x 4" x 1.25") steel enclosure
- Type B USB connector features industrial strength and high-retention design

FACTORY OPTIONS

- Economy 'E' version available without screw terminal adaptor
- OEM (board only) available
- External power and AC/DC adaptor
- DIN rail mounting provision
- RoHS Available. Please contact us for ordering information

FUNCTIONAL DESCRIPTION

The USB-CTR-15 is an ideal solution for adding portable, easy-to-install, counter/timer capabilities to any PC or embedded system with a USB port. This board is packaged in a small, rugged, industrial enclosure and features 15 independent 16-bit counter/timers. The unit is a true USB 2.0 device, offering the highest speed available with the USB bus. It is fully compatible with both USB 1.1 and USB 2.0 ports. The unit is plug-and-play allowing quick connect/disconnect whenever you need additional counter/timer devices on your USB port. The USB-CTR-15 can be used for a wide variety of measurement applications including event counting, frequency measurements, position measurement, pulse counting, pulse-width modulation and pulse generation. The OEM version provides just the board without the enclosure or external screw terminal board and is ideal for a variety of embedded OEM applications.

The USB-CTR-15 features five fully-undedicated industry standard 82C54 counter/timer chips. Each 82C54 provides three independent software programmable 16-bit counters. The maximum allowable input frequency is 10 MHz. I/O wiring connections are provided via an industry standard 50-pin IDC connector or via a removable screw terminal adapter board. A User Configuration Adapter board is also provided to assist in wiring the counters together. This allows for flexible yet easy counter concatenation/configuration.

The USB-CTR-15 is designed to be used in rugged industrial environments but is small enough to fit nicely onto any desk or testing station. The board measures just 3.550 by 3.775 inches and ships with or without a steel powder-coated enclosure with an anti-skid bottom.

OEM USB/104 FORM FACTOR

What makes the OEM option unique is that its PCB size and mounting holes match the PC/104 form factor (without the bus connections). This allows our rugged counter/timer board to be added to any PCI-104 or PC/104 stack by connecting it to a simple USB port usually included on-board with embedded CPU form factors such as EBX, EPIC, and PC/104 - especially important since many newer CPU chipsets do not support ISA and have plenty of USB ports. Future stacks will be using the extremely fast PCI Express bus which is essentially overkill for simple digital monitoring and control. The USB-CTR-15 OEM board can also be added into many pre-existing standard PC/104 based systems and enclosures. The OEM (board only) version is perfect for a variety of embedded applications. The board's pre-drilled mounting holes allow for installation using standoffs inside most enclosures or systems.

High Retention USB Connector

 The ever-growing presence of USB in the industrial/military marketplace has driven the need for USB connections to be reliable, dependable, and unfailing. Gone are the days of loose USB connections. A type B USB connector is used on all USB/104 products which features a high retention design that complies with the class 1, Div II minimum withdrawal requirement of over 3 pounds of force (15 Newtons). This connector has an orange color-coded insulator to quickly differentiate it from standard USB connectors. Using these USB connectors increases reliability in your system and ensures a tight connection. For embedded OEM type applications, an additional miniature USB input header is provided in parallel with the type B connector.

Applications

- Home
- Portable
- Laptop
- Education
- Laboratory
- Industrial Automation
- Embedded OEM

SOFTWARE

The USB-CTR-15 is supported for use in most operating systems and includes a free Linux (including Mac OS X) and Windows 98/NT/2000/XP/2003 compatible software package. This package contains sample programs and source code in Visual Basic, Delphi, C++ Builder, and Visual C++ for Windows. Also incorporated is a graphical setup program in Windows. Third party support includes a Windows standard DLL interface usable from the most popular application programs, and includes example LabVIEW VIs. Embedded OS support includes Windows XPe.

ACCESSORIES

The USB-CTR-15 is available with optional cable assemblies, screw termination boards, and an optional external AC/DC power supply.

Block Diagram
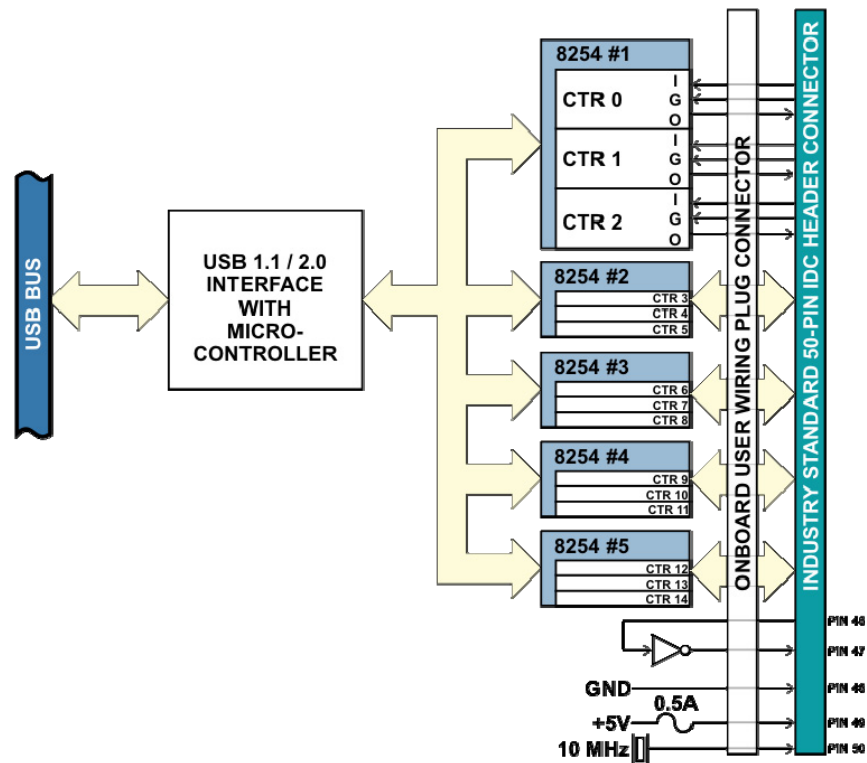
Specifications

Counter/Timers
- Type: 82C54-10 programmable interval counters
- Output Drive:
  - 2.0 VDC min., source 32 mA
  - 0.55 VDC max., sink 64 mA
- Maximum Input Frequency: 10MHz
- Input Gate: TTL/CMOS compatible
- Clock: On-board, 10 MHz crystal-controlled clock
- Active Count Edge: Negative edge
- Minimum Clock Pulse Width: (input characteristic) 30 ns high, 40 ns low
- Minimum Divisor: divide-by-2
- Maximum Divisor: divide-by-65536 (16-bits, load value "0")
- Timer Range: 16 bits

Bus Type
- USB2.0 high-speed (480 Mb/s)
- circa 4000 transactions per second

Power
- Basic unit: 60mA typical (no load); 12mA with max counter transitions
- +5 VDC from the USB bus or external power supply depending on user configuration

The USB bus is specified to provide 500 mA to most desktop environments. This gives you 440 mA available (500mA -60mA = 440mA). If using more than a total of 500mA, use optional 9 VDC (on board voltage regulator outputs +5 VDC to card) external power supply and remove VUSB jumper and place jumper on VEXT. Then plug in external power before plugging into USB port . This option will give you a total of 1000mA available.

- +5V resettable fuse at 0.5A located on connector

Environmental
- Operating Temperature Range: 0°C. to 70°C
- Storage Temperature Range: -40°C. to +85°C
- Humidity: 0 to 90% RH, non-condensing
- Board Dimension: 3.550 x 3.775 inches
- Box Dimension: 4.00 x 4.00 x 1.25 inches

Regulatory Compliance
This product is designed to be in full compliance with CE requirements.

Ordering Information

USB-CTR-15	Enclosure, module and screw terminal board
USB-CTR-15E	Economy model (no screw terminal board)
USB-CTR-15-OEM	Board only (no enclosure or screw terminal board)
MP104-DIN	DIN rail mounting provision

Options:
-P	External power and AC/DC adapter